

This brief survey of work done whilst showing that much has been revealed suggests that a great deal more may be accomplished by exploring the hundreds of caves yet untouched in the coastal belt of South-western Australia so giving us a more accurate picture of the mammalian fauna of Western Australia in pre-historic times.

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BIOCLIMATIC CONTROLS IN WESTERN AUSTRALIA

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(Continued from p. 84)

EVAPOTRANSPIRATION

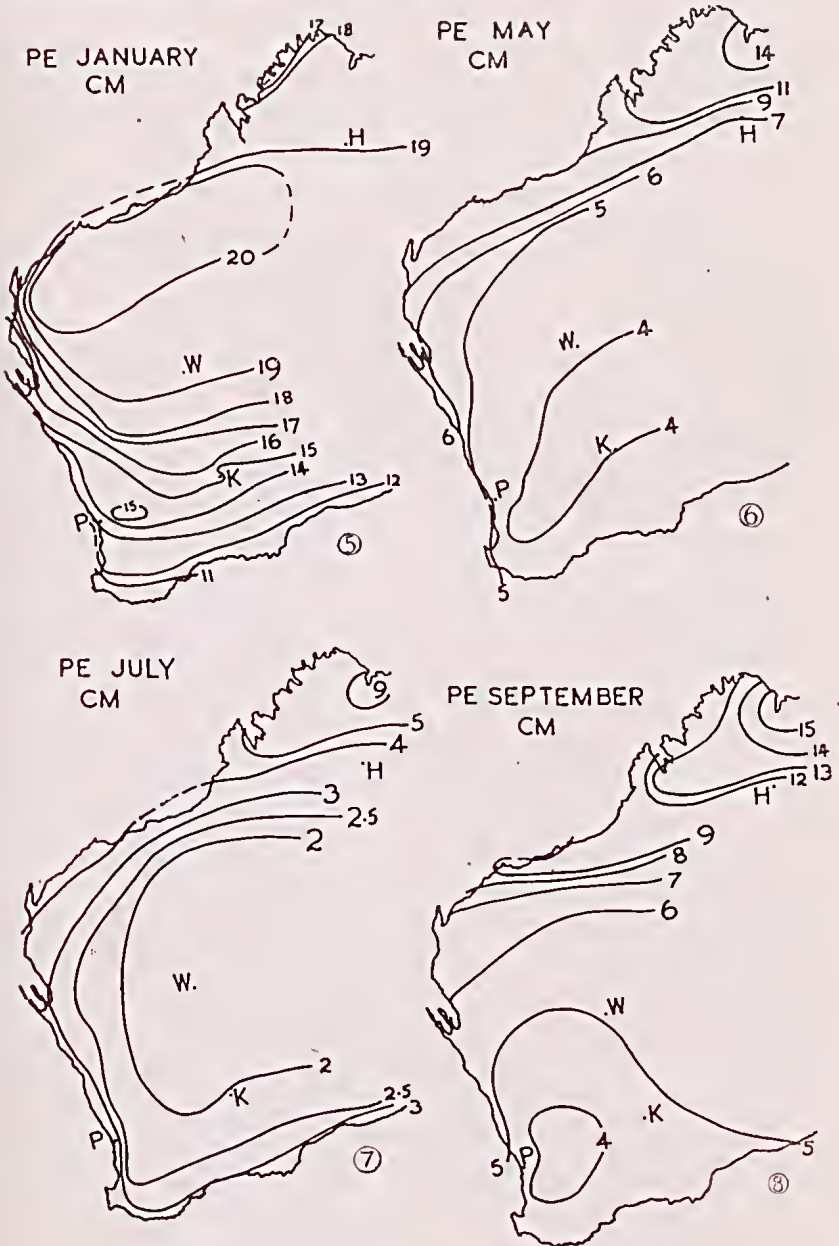
Evaporation is by far the least known of all climatic elements. There is a deep disagreement among climatologists even as to the instruments to be used for its measurement. Most work done in the past is based on evaporation from a free water surface, under conditions which are very far from those prevailing in nature. Recent research work conducted in North America principally by C. W. Thornthwaite has led to the measurement of evaporation from soil and transpiration from plants, the two phenomena being combined under the name of evapo-transpiration.

The direct measurement of evapo-transpiration is highly technical, but recently published formulae and graphs permit the estimate of potential evapo-transpiration, which is the amount of water that soils and plants can evaporate and transpire respectively when they have an unlimited supply of water from which to draw. This estimate is of great importance in assessing the movement and loss of water in soils, plants and animals under natural conditions.

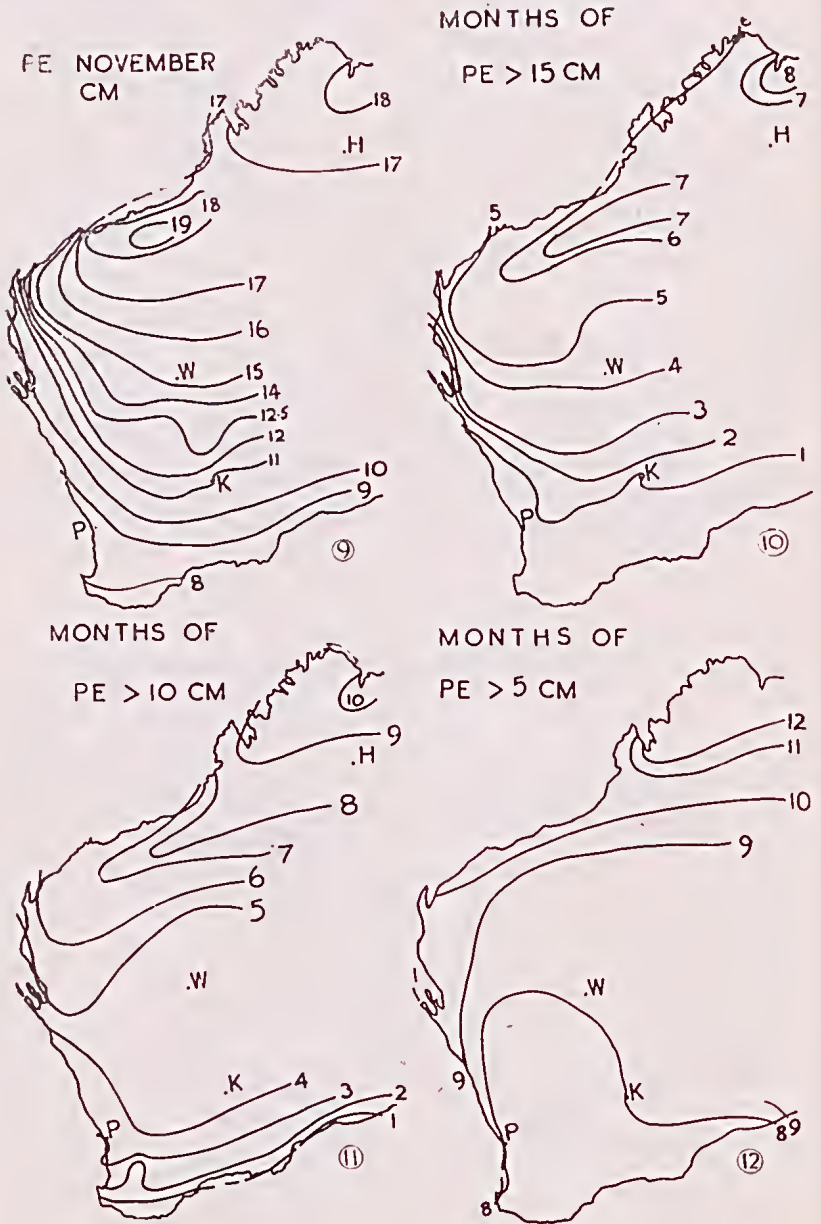
The formulae and graphs for the computation of evapo-transpiration were originally published by Thornthwaite in the *Geographical Review* for January, 1948. The computations and drawing of the maps for the present paper were carried out by

the author at the University of Western Australia, using the normal values of mean monthly temperature and total monthly precipitation as given for various localities in C.S.I.R. Pamphlet No. 42.

In the accompanying maps potential evapo-transpiration (PE) is shown in centimetres, according to international scientific practice. The figures represent the depth of water which can be evaporated within one month by soil and vegetation combined.



In January (Map 5) the highest PE is found in the North-west and is due to the very high temperatures caused there by the persistent flow of tropical continental air. The South-west benefits from the influence of the ocean and its PE is relatively low. The north-western ring of extremely high PE gradually disappears during the following months, until the map for May (Map 6) shows an entirely different pattern, with the moderating influence of the ocean causing higher PE near the coast than in the interior.



In July (Map 7, the effect of continental cooling is evident, and the continental core has lower PE than any point near the coast. This is the month of lowest PE in the State. It is worth noting that Wyndham still reaches the total of over 9 em. for the month.

In September (Map 8) a loop of high PE begins to appear in the north, with a tendency to spread towards the Hamersley area. The area of low PE because of continental cooling is now limited to a small region between Northam, Wagin and Southern Cross, but a relatively low PE (5 em.) is found as far north as Murgoo and Cue. In November (Map 9) the hot loop has divided into two rings, one around Wyndham, the other one in the North-west, where it will reach its greatest development in January. The heating up of the continental interior now brings high PE southwards, for instance 11 cm. at Kalgoorlie, while the ocean keeps PE low near the coast, where even Carnarvon has less than 11 cm. PE.

The small low-lying area around Wyndham has over eight months with a PE above 15 em. (Map 10). The Pilbarra district follows with over seven months. The South-west from Geraldton to York and eastwards past Kalgoorlie has less than one month with such a high PE. A similar pattern is disclosed by Map 11, which shows the number of months with a PE over 10 cm. The great difference between South-west and North-west is still apparent. Map 12 shows the number of months with PE above 5 cm.; the pattern is quite different, with the far South-west coast and South-east having more than eight months with such a PE, and Murgoo, Cue and other relatively northerly localities having less than eight months, probably because of the cooling effect of continental winter.

(The place names on the maps are indicated by the following initials: H., Hall's Creek; W., Wiluna; K., Kalgoorlie; and P., Perth.)

(To be continued)

REPORTS OF EXCURSIONS

LAKE LESCHENAULTIA

The excursion of Western Australian Naturalists' Club members to Lake Leschenaultia on April 4, 1948 was well attended and general observations on the flora and fauna of the lake and surrounding bushland were carried out.

The lake is an artificial one, being the dammed up headwaters of Cookes Brook which flows in a northerly direction into the Wooroloo Brook and thence into the Avon River. It covers an area of 62 acres when full and is 938 feet above sea-level, being about one mile from Chidlow. The dam was surveyed in 1910 and completed in 1912 for the W.A. Government Railways as a source of water for the department's locomotives. However owing to its variable salinity, which at times reaches 60 grains per gallon, and that it has proved more economical to draw water supplies from the Goldfields Water Supply pipeline, the dam has had little use.